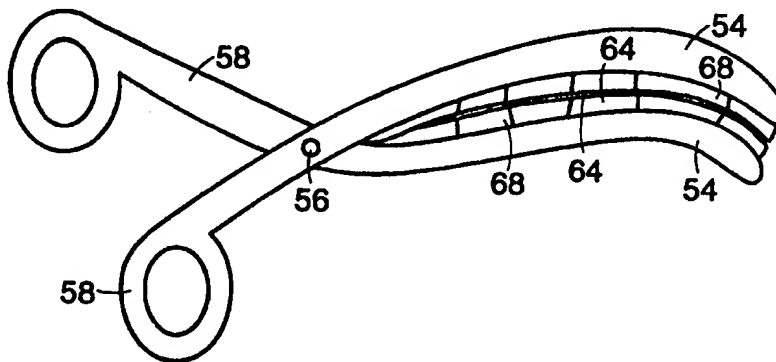




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : A61B 17/39	A3	(11) International Publication Number: WO 99/59486 (43) International Publication Date: 25 November 1999 (25.11.99)
(21) International Application Number: PCT/US99/11164 (22) International Filing Date: 20 May 1999 (20.05.99) (30) Priority Data: 09/082,047 20 May 1998 (20.05.98) US (71) Applicant: NEW ENGLAND MEDICAL CENTER [US/US]; 750 Washington Street, Boston, MA 02111 (US). (72) Inventors: WANG, Paul, J.; 209 Middlesex Road, Chestnut Hill, MA 02467 (US). RASTEGAR, Hassan; 102 Garland Road, Newton, MA 02159 (US). (74) Agent: MOORE, Ronda, P.; Testa, Hurwitz & Thibault, LLP, High Street Tower, 125 High Street, Boston, MA 02110 (US).		(81) Designated States: AU, CA, JP, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> (88) Date of publication of the international search report: 6 April 2000 (06.04.00)
(54) Title: SYSTEM FOR CARDIAC ARRHYTHMIAS TREATMENT BY ABLATION, AND TMR (57) Abstract <p>A medical device, and related method, use epicardial ablaters and detectors for intraoperative epicardial approaches to ablation therapy of cardiac conduction pathways. An epicardial gripper is sized to grasp the cardiac circumference or smaller structures on the epicardial surface of the heart. Ablators are disposed on the arms of the gripper for epicardial ablation of cardiac conduction tissue. In another embodiment of the invention, an electrode system includes a flexible, adjustable probe forming a loop for epicardial ablation. Ablators are provided on one or multiple surfaces of the probe for epicardial ablation of cardiac conduction tissue. In yet another embodiment of the invention, an endocardial ablator detection system provides an indicator adjacent an ablator on an endocardial catheter, and a detector on an epicardial probe. The epicardial probe detects signals transmitted by the indicator on the endocardial catheter to localize the position of the endocardial ablator relative to the epicardial surface. The surgeon uses this information for guidance in adjusting the position of the endocardial ablator according to therapeutic objectives of cardiac ablation.</p>		



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/11164

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A61B17/39

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 443 463 A (STERN ROGER A ET AL) 22 August 1995 (1995-08-22) page 6, line 9-30 ---	1,3,13, 14
X	WO 96 26675 A (BOSTON SCIENT CORP) 6 September 1996 (1996-09-06) page 16, line 10-17; figure 5 abstract -----	1,3,8,10

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

22 September 1999

Date of mailing of the international search report

10.01 2000

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

PAPONE, F

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 99/ 11164

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 20-25, 51, 52, 65-68
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(iv) PCT - Method for treatment of the human or animal body by surgery
2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

1. Claims: 1-19

a gripper device for cardiac ablation

2. Claims: 26-50,53

electrode system having a flexible substrate closed loop

3. Claims: 54-64

system for detecting location of endocardiac ablator

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 99/11164

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5443463 A	22-08-1995	US 5277201 A	11-01-1994
		WO 9605776 A	29-02-1996
		AU 7671594 A	14-03-1996
		US 5562720 A	08-10-1996
		AT 164503 T	15-04-1998
		AU 4105293 A	29-11-1993
		CA 2117900 A	11-11-1993
		DE 69317776 D	07-05-1998
		DE 69317776 T	10-09-1998
		EP 0637943 A	15-02-1995
		FI 945112 A	31-10-1994
		IL 105523 A	10-01-1997
		JP 7506033 T	06-07-1995
		NO 944072 A	26-10-1994
		US 5443470 A	22-08-1995
		WO 9321846 A	11-11-1993
		US 5713942 A	03-02-1998
		EP 0783274 A	16-07-1997
		JP 10504485 T	06-05-1998

WO 9626675 A	06-09-1996	NONE	
